

# CAN ARCHITECTURE EXIST WITHOUT IMAGE...???

**Anupa Kulkarni<sup>1</sup>, Sarika Bahadure<sup>2</sup>**

<sup>1</sup>Student, <sup>2</sup>Assistant Professor, Department of Architecture and Planning,  
Visvesvaraya National Institute of Technology, Nagpur, (India)

## ABSTRACT

Human existence gives identity to a place. Space gets enhanced when it is filled with interactive elements. Tenure of presence is truly felt when designing of a building makes an individual move through space while experiencing through senses. The study concentrates on perception of architecture by blind people and their understanding towards a logical approach to create an image in their minds. Understanding of senses and their relationship with the surrounding gives a fair idea of how this world could possibly exist for blind people as every sense has its own specific way to connect to the surrounding.

Built environment can be broken into miniature pieces to create a shape that results in a specific typology associated for a particular function. This helps blind people develop a sense of recognition of that place finally connecting to form an unknown image which might be blurred initially but could specify a sensually targeted environment. The study at the end tries to understand the ways in which buildings are perceived by the blind people and their interaction with the surrounding.

**Keywords:** Architecture, Blind, Experience, Senses

## I. INTRODUCTION

Humans travel through space and time in architecture. The features in the extraordinary building structures develop a sense of belonging connecting the built environment physically as well as emotionally with the person. The behavioural pattern of a person changes when his surrounding creates a different ambience. Senses make it easier to understand the developmental phase as well as the structural importance that has created the marvel into the state of occurrence. All human senses receive equal importance while experiencing a space through time.

Sight is the most important amongst the five senses and it imparts knowledge of building aesthetics. The world of architecture turned its inclination to development in aesthetics since there has been a change in perspective of human to make buildings appealing through sense of sight. What happens when this sense of vision is expelled from experiencing architecture? Does it create an image in similar way as it exists? The five senses sight, sound, smell, touch and taste impart information of the surrounding in more intricate patterns creating an atmosphere which is appropriate for buildings to narrate their presence with respect to the space. Interdependence of architecture with senses has an impact on the nature of architecture.

## II. NEED IDENTIFICATION

Over importance to sight in architecture can lead experience to isolate the buildings on the presence of their appearance which further creates detachment and exteriority. On the other hand, if all the senses are

incorporated while experience, it strengthens our sense of reality and self involving human with the surrounding giving him pleasure and satisfaction [1].

Sight is the perfect element of human body that connects us directly with the built environment. Devoid of this precious element makes the architectural space just a piece of un-built image which needs to be polished with reality. An un-built image is one in which there are different experiences scattered which needs to be identified by blind people to fit into places while experiencing a space to form a complete image. Like a jig-saw-puzzle, architecture is also in pieces; experienced in different ways to form a complete image of built vision. Our other senses also have a potential to transfer this un-built vision into image through imagination. This can possibly be done by dismantling the actual built space into simplest form to create image which is similar to one that exists. Vision gives us stability; other senses do the same in a specialized manner.

Thus, there is a need to study how architecture is perceived by blind people and their understanding towards architecture so as to derive the ways in which these images of buildings and surrounding spaces are formed in their minds.

### III. SENSES AND ARCHITECTURE – A journey

A work of architecture can take us on a journey, like a story or a piece of music, influencing our moods in different ways at successive stages along the path. Space has more than three dimensions. In addition to length, breadth and height, space also has dimensions like movement and density. Our sense of space is generated by movement. It states much beyond aesthetics on individual's mind.

#### 3.1. Indian Temples – A journey through senses

A travel through a space imbibes much in sentiments and emotions when travel becomes a part of serenity. It directly connects the individual to the surrounding making it not just an experience but sanctified approach.

Architecture plays very important role in formulation of expressions and emotions in human beings. A Hindu Temple best illustrates this process. Entry to this divine place is made bare foot thereby experiencing the tactile flooring below. Many entrances have water taps or pond for washing hands and feet thus giving a feeling of purity and clearance. Ringing of bells evokes our aural sense thus imparting peace of mind and serenity. This is then

followed by awakening olfactory sense by those scented sticks in front of the Idol. Ringing of bells evokes our aural sense thus imparting peace of mind and serenity. This is then followed by awakening olfactory sense by those scented sticks in front of the Idol. This place forms the silent and most engrossing part of the temple. While leaving the garbhagriha, *prasad*<sup>1</sup> enlightens the sense of taste (figure 1). This journey touches all the senses of human body and emotions thus creating an atmosphere that connects directly from one soul to another.

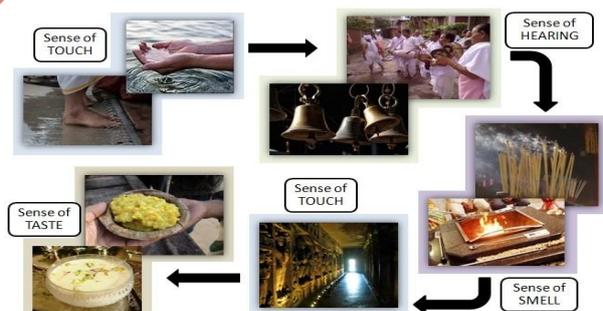


Figure 1 Concept of Indian Temples explained with respect to movement and the interaction with senses

<sup>1</sup> is a food substance that is a religious offering in Hinduism, Jainism and Sikhism, which is consumed by worshippers

### 3.2. History and Senses

Traditional architecture is also connected with wisdom of body rather than just giving importance to sight. It relies on the principle of how birds create their nest with the help of their body and introduce space. In Greek times, vision occupied third position after sound and smell while experiencing buildings. This period preferred hearing and smelling over sight. During Renaissance period the five senses are considered in hierarchical form to understand a building from vision to touch; vision for fire and light, hearing to air, vapour to smell, taste to water and touch to earth. Baroque architecture was also concentrated on other sensory inputs like tactility rather than giving importance to just ocular experience [1]. Modern times are changing its path towards a sensory approach concentrating on all the senses simultaneously. This has resulted in establishing a direct relationship between the building and humans.

### 3.3. Measuring Senses

#### 3.3.1. Natural Elements

Every element in nature like fire, wind, water and earth has its own cognitive effect on humans. These elements connect directly to two or more senses of human body transferring some information in its own congenital way. Earth (soil) enhances our sense of touch, smell and taste while fire enhances sense of touch and smell. Air enriches sense of touch, smell and sound while water exalts our sense of touch, sound and taste. At a point of time, combination of senses is active thus making the experience more inclusive.

#### 3.3.2. Touch

This sense directly feels the surrounding, but it has a more inviting effect on a person than perception. Places which are welcoming by touch than those by sight have a greater emotional effect on individual. Tactile sense plays a very important role in the sensory experience of a person. Materials used in the surrounding not only give the texture difference but also temperature difference. Our body can get information regarding texture, weight, density and temperature of things.

Elements of building like jali pattern in corridors, curved shape for parapet wall and columns help in orientation as well as it creates the journey interesting. Different patterns on the floor help blind people in navigation.



Figure 2 Sense of Touch in various places

Writings on the parapet wall can also become very interactive and help in navigation (figure 2). Sense of touch transfers information directly and precise. This sense creates a direct relationship with the perceiver. It also gives information regarding size, volume and consistency of environment [1].

#### 3.3.4. Smell

The most persistent memory of any space is its smell. Nostrils make us remember a forgotten memory. When we smell a particular thing in the surrounding, it makes us remember and connect to a particular space with a feeling. This special feeling directly associates a particular hypothesis of a place and develops image of the surrounding.

The smell of a dusty room has its own scent while the smell of a dry fish market is very precise. The room inhabited by bats have a typical smell. Enclosed areas like caves have their specific smell. The finishing of a particular material can also impart smell (figure 3). The scent can leave memories and assist blind in directions by its intensity in a particular place. Every dwelling has its own unique smell [2].



Figure 3 Sense of Smell in various place

### 3.3.5. Sound

Sound creates an experience of interiority. Sound gives a sense of balance in the environment. It connects a place with a person. Sound resonates and gives a pleasant feeling of protection in a given surrounding. Body feels at peace when it can feel the surroundings making or reflecting sound.

The combination of form, volume of room and acoustical treatment decides way the building sound. This enhances a blind person in experiencing a different exploration and understanding of place. People can easily determine the direction of sound even in darkness. Variations can be made in volume, material and form to create frequencies and reverberations. There exists a different expression of sound in an empty room. Sound travels in its own unique way from one end of tunnel to another. Chaos in the crowd has high intensity of sound concentrated in small area of the environment. Large rooms like auditoriums have acoustical treatments on walls and ceilings to control reflections of sound and to transfer sound to every corner in controlled manner. While sound just disappears in large woods without any intensity over a long distance (figure 4) [2].

### 3.3.6. Taste

We do not directly taste pieces in architecture. Every individual has its special liking for a particular style of buildings which defines individual's taste in architecture. This different taste imparts different feelings and behaviours when an individual experience the building. The standard list of five senses doesn't really give our bodies credit for all of the amazing things they can do. We can also sense direction, intensity and magnitude of the surrounding. A sense of movement, rhythm, balance, pressure and warmth are other subtle senses which can also help in experiencing architecture in a different manner [2].



Figure 4 Sense of Sound in various places



Figure 5 Different buildings denoting various Tastes in Architecture

Calatrava's structure has its own unique style which imparts a particular taste to his admirer. When seen at Hawa Mahal, it has its own expression of repetition thus imparting a different taste to a person who likes it. The houses at St. Augustine, Florida have its special taste of traditional appearance. The Bangalore Palace covered with creepers which keep it cool has its own taste. Greater London Authority designed by Norman Foster has its special form and ambience to merge with the environment indicates a different taste (figure 5).

#### IV. INTERACTION OF BLIND PEOPLE WITH SPACES

Beauty described in true context is a pleasure in terms of aesthetics. It is an 'eye attracting function' of feelings and emotions. But it poses a question when blind people are associated with beauty and its meaning. Do they experience buildings in terms of aesthetics? Then how do they perceive it? How do blind people define 'Beauty'? When and how is their Senses get Activated? When do they feel Comfortable? Human body plays a very crucial role in understanding all architectural forms in the surrounding.

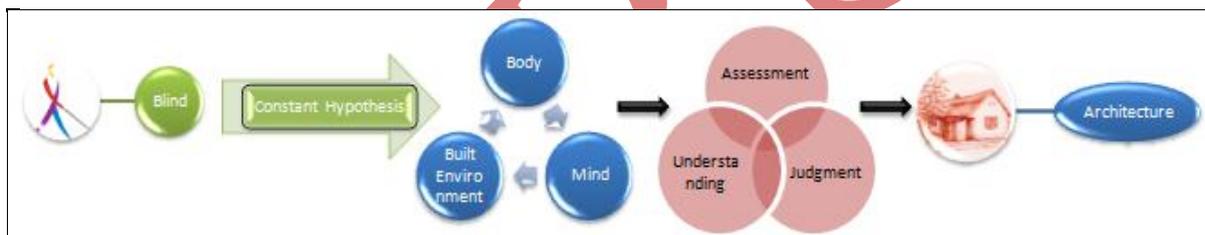


Figure 6 Approach of blind people while experiencing architecture

When relating blind person with architecture, his mind goes through a series of steps to understand the scenario around him. When he enters a particular place, his mind is constantly under critical hypothesis analysing and evaluating the function of a surrounding space (figure 6). His body and mind interacts with the built environment exchanging whispers of present environment on basis of which the blind person assess, judge and understand concrete features of present place [3].

#### 4.1. Mobility

The understanding of mobility while travelling through environment is an essential part to overcome navigational resentment of the blind people. Travel is made easy when approach way does not have a labyrinthine or a complicated structure. A complex structure confuses blind people while navigation. Mobility can also be made easy by using simple shapes of elements in surroundings viz. square, rectangle, circle and triangle so that the blind person can rely on shape and orientation. A blind person has various options for understanding the navigation in a particular place [4]. He can be accompanied by another person or an animal that helps him throughout his travel. Tactile maps in books and information gathered through books can help blind people get information of a place (figure 7).



**Figure 7 various options for blind people to navigate**

Every human has designated percent of ‘Spatial Intelligence’ by which he easily grasps things in the environment and memorise paths just through walkway. This spatial reasoning in blind person helps them to interpret tactile sensations into mental calculation of dimension and visualisation of form [5]. So, while designing any space, it should be taken into consideration that the path should not be so easy that it becomes boring, neither it should be so complicated that it becomes hard to memorise.

#### **4.2. Mobility and Senses**

Senses can help in easy navigation through a place. Tactile markings on floor and walls can help a blind person use his sense of touch in an efficient way to travel from one place to another. Smell of different flowers can prove very helpful for navigation in a garden, while vegetables can guide a person from one part of the market store to another along with orientation in the store. Small speakers can be placed on the walls, entrances, corridors to constantly guide a blind person in the building. Nowadays, navigation sound equipments are available for blind people for travel assistance (figure 8).



**Figure 8 Various options for blind people to navigate with use of**

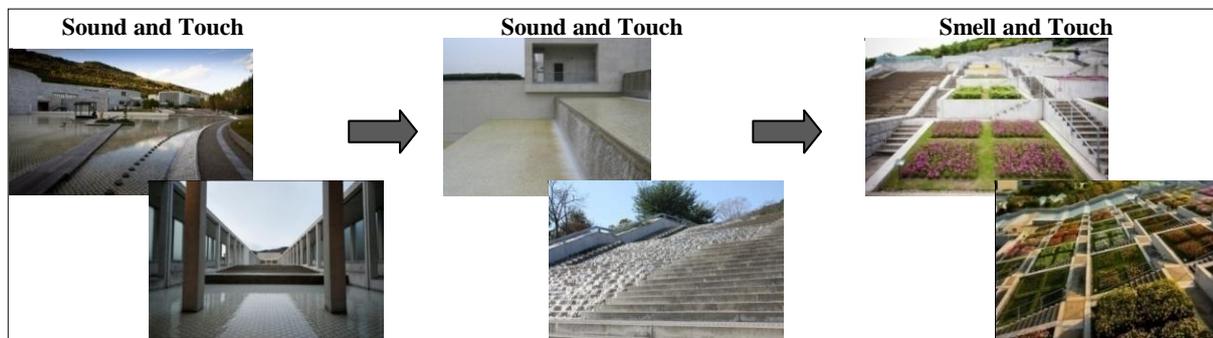
### **V. CASE STUDIES**

The literature case studies has been done to understand the interaction and association of senses with built environment and then with blind people. Tadao Ando’s Awaji Yumebutai’s environment creation states how the spaces can be designed to sensitise the senses. The experience of the non blind person’s has been traced in Dialogue in dark, when he becomes temporary blind for the time he is in this place. The Hazelwood blind School gives an insight of the design details to be incorporated for blind students.

#### **5.1. Awaji Yemubutai, Japan**

The Awaji Yumebutai is a conference centre, resort and memorial. It is designed to follow enticement developed through succession of places which are explored through senses while moving from one place to another. It has the observation terrace approximately 20,400 m<sup>2</sup> of area that consists of Hyakudanen, Shell Garden and the rooftop observation terrace. Hyakudanen is a terraced flowerbed along the side of a mountain

and the shell garden has 1000 fountains [6]. Shells embedded in concrete forms the base of the fountains from where water flows to different places. Water acts as a major medium of navigation from one place to another. Fountain water flows to form waterfalls and then into cascades flowing through internal courtyards, semi-open spaces and staircases. Places are arranged in geometric progression to create a realization of vastness of place [7], (figure 9).



**Figure 9 Travel from one place to another through senses in Awaji Yumebutai**

Different elements in the environment help in engaging all the senses. The experience, therefore, becomes exciting and memorable. Change of places in succession while following senses can make the area not only fascinating but also increases curiosity to explore in adventurous manner.

## 5.2. Dialogue in the dark, Hyderabad

‘Dialogue in the dark’ is a specially designed space in darkness and is an exhibition and workshop to explore the unseen. It works on the main of direct encounter with darkness to experience the life of a blind person [8]. In ‘Dialogue in the Dark’, visitors are led through different types of experiences which are common in daily routine like cafe, park, etc. In these experiences, sighted people become blind in extreme darkness and blind guides become their ray of hope providing them with security and a sense of orientation - transmitting world without pictures. The blind and partially sighted guides open the visitors' eyes in the dark to show them that their world is not poorer but just different [9].

The area of 1100 square feet accommodates five types of experiences in all. As the visitors follow the left wall, light disappears gradually leaving a blank and black screen all over. The realisation of changing surfaces becomes prominent as one move from rocks to gravels, then to grass. The thrill of crossing a shaky bridge over a river becomes one of a kind for the visitors. The vegetation on the other side of bridge consists of flowering plants, herbs and huge tree trunk. The visitors are asked to touch the stream of cold and bubbling water in darkness by tracing its direction on basis of sound.

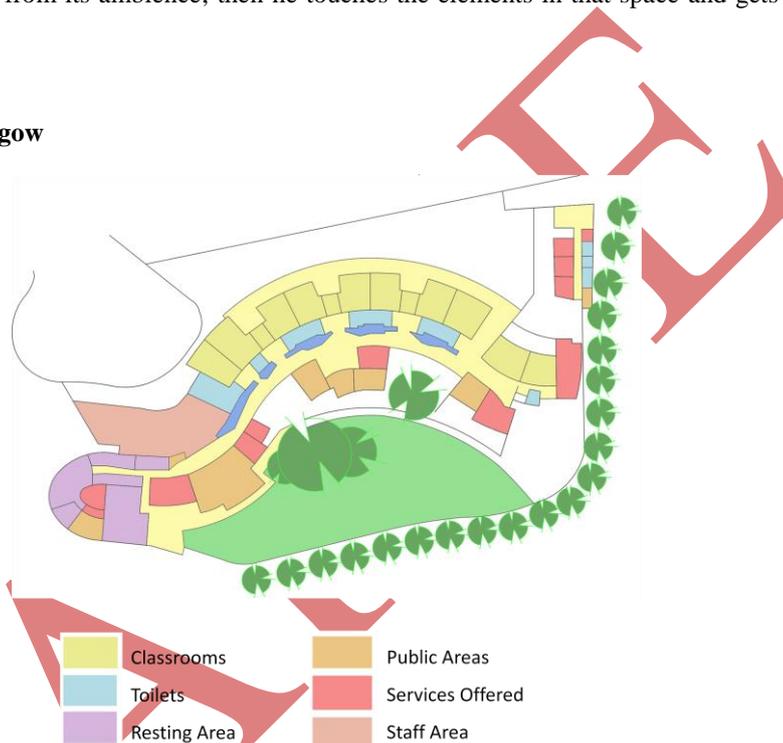
After this, the visitors are asked to follow right wall which leads them to a shelf on which all the things of daily use like brush, paste, soap, vegetables and fruits, turmeric, cloves, etc. are placed. Guessing those things becomes a tricky experience for the visitors. The idea of playing cricket in the dark becomes very unique for the visitors. The sound of the ball approaching needs full concentration so that a perfect hit could give them good scores. It becomes a different experience for the visitors to travel by boat in darkness. The sound of waves and feel of boat movement makes mesmerising impact on the travellers aboard. Last, but not least, visitors are taken to cafeteria where travellers bought things of their choice thus experiencing a different manner of trade in the

dark. The person serving in cafeteria is blind person but he efficiently and accurately recognise rupee notes and coins. Then the visitors are taken through a passage which leads them to light again, thus ending their journey through darkness.

**Emotional impact:** For a sighted person, sighted-less is frustrating and scary in the beginning as the person has no idea how to do things on his own as a blind individual. But eventually, when he tries to focus on other senses and tries to understand the surrounding and can win over darkness.

**Architectural Impact:** When the things are touched, the visitors' tries to understand its texture, smell and then relate it to other things which he had already experienced and then recognize it. When someone enters in a space, he tries to recognize it from its ambience; then he touches the elements in that space and gets a holistic view of the same.

### 5.3. Hazelwood School, Glasgow



**Figure 10 Site plan of the Hazelwood School, Glasgow**

Hazelwood School is specially designed for children who are blind. Preaching's since childhood make these blind children confident to face the journey of life by exploring and experiencing. This school is in Scotland and it is one of the best institutes for blind children. The planning of the school is combination of arrangements like having a common entrance place and dispersion into respective areas along corridors (refer figure 10).



**Figure 11 Various arrangements in Hazelwood School for blind children to navigate easily**

The design of school is in such a way that all classrooms and utilization areas face north while all the less used spaces like toilets, services and resting areas face south. Slate wall is provided as heat and noise absorbing material in the south. Vegetation is provided all across the façade facing roads on outside to reduce noise. In the drop-off area, texture difference is prominent of the road, pavement and grass

helping the blind in orientation. Material changes as the area changes. The corridors inside the school are designed in a very practical way as a guideline for navigating freely in any area without assistance (figure 11) [10].

The building is environmentally sustainable with external area as sensory garden. Classrooms have clerestory windows allowing natural ventilation and light which reduces amount of electricity consumed. Clerestory windows reduce need for artificial lighting. Intelligent daylight linked controls have been installed. Different textures are used on all walls of the classroom and have only one entrance to reduce confusion. The arrangement of tables and chairs are such that teacher can access every student while teaching. Children play with toys which makes noise. Tactile features are used on the walls to help children understand things easily [11] [12].

Thus, the design details help blind children to develop and use their senses to the fullest capacity. This makes the blind children independent and mature to face the difficulties in the outside world so as to be successful.

## VI. SURVEY, DATA COLLECTION AND OBSERVATION

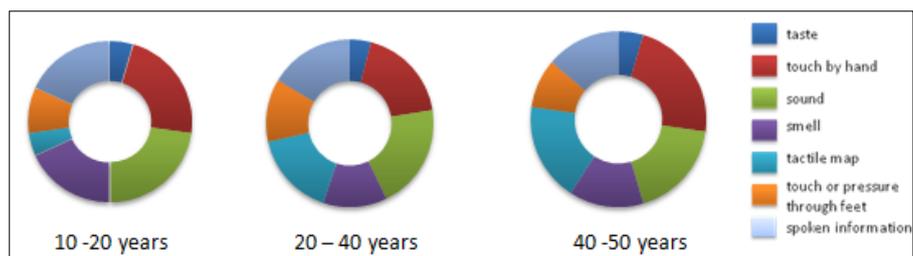
A survey was carried out to understand various aspects in which blind people use their senses to know about the surrounding. The survey also concentrated on the way blind people understand buildings and it's surrounding to create a special image in their minds. Blind people rely completely on their senses other than vision. This makes it important to study the utilization of various senses by blind people to know about their surroundings. When blind people visit a place, they use all their senses simultaneously to recognise a place; it depends on the percentage to which these senses are used at a particular place. Places have their own ambience and when blind people come in contact with a place; its ambience gets registered in their mind. This ambience helps them to connect and recognise other places they visit

### 6.1. Senses and Surroundings

Perception survey was carried out to understand the interaction of blind people with the senses and surrounding. When blind people enter a place, they use all their senses but in varied proportions. The samples were selected randomly and were divided in three age groups. All the senses except vision are considered for this study.

**Table 1: Use of various senses while experiencing surroundings in different age groups**

Age group	Indicating how important from 0 (totally unimportant) to 5 (very important) each of the following senses or types is telling you about your surrounding						
	taste	touch by hand	sound	smell	tactile map	touch or pressure through feet	spoken information
10 – 20 years	1	5	5	4	1	2	4
20 – 40 years	1	4.5	5	3	4	3	4
40 – 50 years	1	5	4	3	4	2	3



**Figure 12 Observation statistics of use of various senses while experiencing**

**Observations:** It was observed that sense of taste does not generally give any information of the surrounding. Sense of Touch and Sound are most informative on which all age groups depend, while use of sense of Smell is optimum in childhood as there persists immaturity in recognising a particular smell and so a blind child tries to react to all smells possible. Spoken information gives a lot of information and helps to understand easily (figure 12).

### 6.2. Blind and Buildings

To understand the interaction of blind people with architecture, their association with the built environment is studied further. Three famous places with varying built and un-built environment were selected. Data was collected from blind people who were present near the selected study site or who had already visited that place. Perception analysis was carried out (table 2). It made clear that every place which a blind person encounters create an image in his mind irrespective of the time he spends in a particular place.

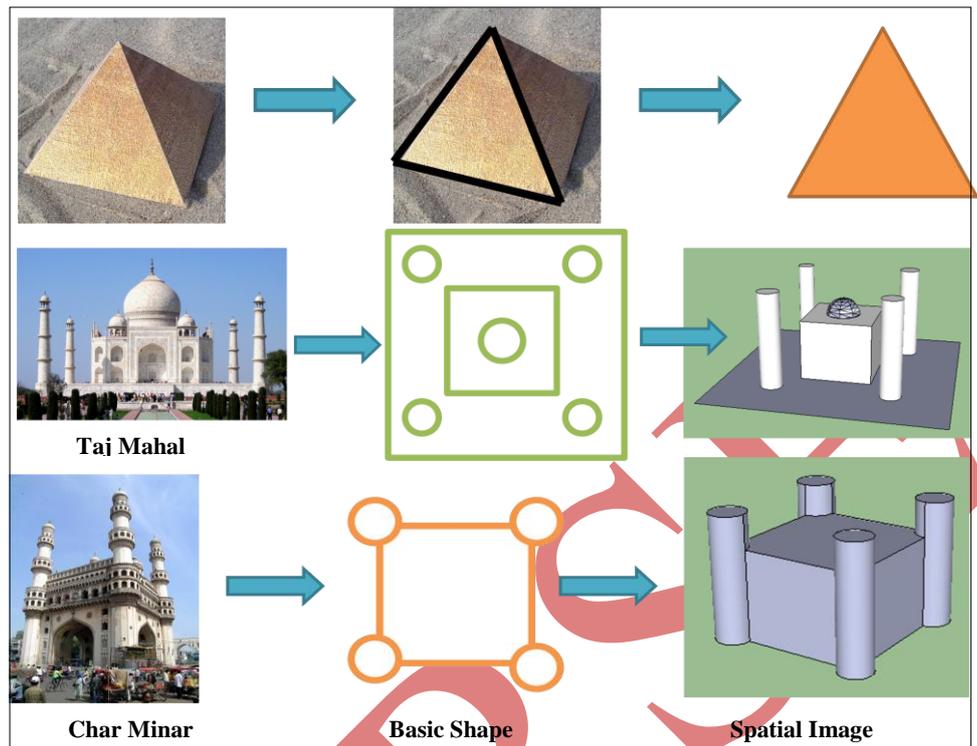
**Table 2: Perception of blind about some places**

Famous Place	Perception	Explanation by people	Actual Visit	Special Feature	Special Feeling	Rough Image
Wadegaon Dam, Nagpur	Hill type region	As a place close to nature	It was a big place with river	Water	Sound of water was pleasing	Big open space
Taj Mahal, Agra	Tall and Big	It looks beautiful	No holistic view of the building	Fountains and Gardens	Many people are in the surrounding; lot of chaos; free and openness	Cube with a dome and minarets
Charminar, Hyderabad	Tall and Big	It is located in market area	It was confusing to orient in surrounding	Small shops in the area	Wind blowing at the monument	Cube with circular staircase at each end

**Observation:** It was observed that blind people understand things like big, small, open, close and few of the basic shapes like square, circle, triangle, etc. They enjoy buildings where there is direct association with natural elements and people. For example, Building surrounded with trees as landscaping along with sitting spaces for people, artificial cascade flowing through a place to another. These experiences are felt either by touch, smell or sound. Blind people touch the buildings, move around in the area around the building and talk to people who are present there.

## VII. INFERENCES

### 7.1 Break things into simplest form



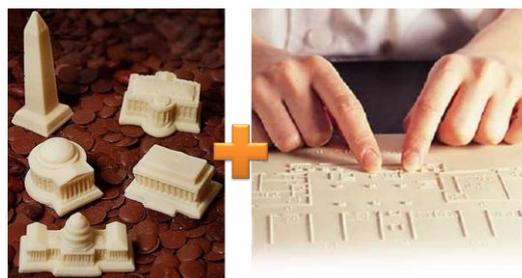
**Figure 13 Approximate spatial images in the minds of blind people**

Blind people understand the surrounding in a very simplified manner. They perceive things by breaking those complexities in simplest approach possible. This makes them interact and communicate with the surrounding built spaces.

Simple structures like pyramids are also broken into simplest form i.e. triangle so that it could be understood in detailed manner. Char Minar is broken to form a special image as a parallelepiped with four cylinders at corners. Complex structure like Taj Mahal is also broken down to a simple form as of a cube in the centre crowned with hemisphere and four cylinders at corners at equal distance from the cube (figure 13).

### 7.2. Provide models and tactile maps

Miniature models associated with tactile map can help blind people understand building and their structure in finer way. Blind people can associate both the things together in relation with the actual building and can navigate easily in the building. This may help them understand buildings even before they actually visit it (figure 14). They may find exciting to explore new places and these places may not only become a place of few hand written words on the pages of books. Blind people have to be made acquainted with building for a holistic view of the structure and not just few places or parts of a structure.



**Figure 14 Miniature models and tactile maps help blind understand buildings**

## VIII. CONCLUSION

World has become concrete on the part of existence with architecture relying just on aesthetics and to be magnificent in terms of size. This has made architecture just a piece of subject oriented towards sighted people without any involvement of emotions. This artificial way of defining architecture in technical terms needs to be refined so as to take into consideration that it is not only a piece of art for aesthetics but also a space resort to emotional amore.

Architecture exists without image, but it needs refinement in terms of specialized cases used to define them. Architecture can be understood by blind people but it needs efforts in terms of planning and involvement of the space. Blind people have altogether a different perspective of imagination when it is with respect to buildings, so it must be communicated with special skills and techniques which help them create an image in simplest form in their minds.

In blind people's interpretation, 'Architecture' is a term which helps them navigate and make them understand a place with use of senses. Co-ordination of senses with built environment associate them with building, giving it characteristic feature defining spaces; finally connecting them to form a huge mass of sensory establishment.

## REFERENCES

- [1] J. Pallasma, *THE EYES OF THE SKIN Architecture and Senses*, England: Wiley-Academy, a division of John Wiley & Sons Ltd, 2005, pp. Part I - 15, 16.
- [2] J. Pallasma, *The Eyes of the Skin Architecture and Senses*, Great Britain: UK: Wiley-Academy, a division of John Wiley & Sons Ltd., 2005, pp. Part II – 51, 54, 56, 59.
- [3] K. Nagahata, "A study of how blind people identify a place by using environmental sounds," *Journal of Acoustic Society of Japan*, vol. 56, no. 6, pp. 406-409, 2000.
- [4] R. F. Browne, "Toward a Mobility Aid for the Blind," in *In Proc. Image and Vision Computing 2003 (IVCNZ)*, Palmerston North, November 2003.
- [5] H. E. Gardner, *Spatial Intelligence' Multiple Intelligences: New Horizons in Theory and Practice*, Basic Books, 2006.
- [6] "Awaji Yumebutai," 2013. [Online]. Available: <http://www.yumebutai.org/english/yumebutai/yumebutai.html>. [Accessed April 213].
- [7] K. Bos, "THE ONE-HUNDRED-STEP-GARDEN (HYAKUDAN-EN)," February 2011. [Online]. Available: <http://www.kb3.eu/icaros/documentsandsettings/documents/file/17.pdf>. [Accessed April 2013].
- [8] Staff Reporter , *Building a long lasting bond,' Dialogue in the dark' is a role-reversal between sighted and visually challenged*, Hyderabad, 2012.
- [9] "Dialogue in the dark," 2011. [Online]. Available: <http://www.dialogue-in-the-dark.com/>. [Accessed March 2013].
- [10] "Hazelwood Glasgow school," [Online]. Available: <http://www.hazelwood.glasgow.sch.uk/>. [Accessed March 2013].
- [11] "Hazelwood School for the Multiple Sensory Impaired," 2012. [Online]. Available: Hazelwood School for the Multiple Sensory Impaired <http://www.designshare.com/index.php/projects/hazelwood-school-for-the-multiple-sensory-impaired/school>. [Accessed March 2013].
- [12] A. Dunlop, "Hazelwood School, Glasgow," *S P A N D R E L*, vol. Spring, no. 4, pp. 133-139, 2012.